



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/674,808 | 10/01/2003 | Koichi Otsuki | Q77778 | 8787 |
| 72875 | 7590 | 03/17/2008 | | |
| SUGHRUE MION, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037 | | | | |
| EXAMINER | | | | |
| FIDLER, SHELBY LEE | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2861 | | | | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
| 03/17/2008 | | ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@sughrue.com
kglyndman@sughrue.com
USPatDocketing@sughrue.com

Office Action Summary

Application No.

10/674,808

Applicant(s)

OTSUKI, KOICHI

Examiner

SHELBY FIDLER

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8 and 18-25 is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date 10/29/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: _____.

DETAILED ACTION

Responsive Office Action

This Office Action is responsive to remarks and amendments filed 12/4/2007.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 10/29/2007 has been considered by the examiner.

Specification

Amendments to the specification were received on 10/29/2007. These amendments are equal in scope to the original specification, and are acceptable.

Claim Objections

Claim 9 objected to because of the following informalities: please change "the position adjustment unit" (top of page 8 of claims) to "the position adjuster" to provide proper antecedent basis to this limitation. Appropriate correction is required.

Claim 9 recites the limitation "the position adjustment setter" (line 6 of the claim). There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This claim states that each of the one or more ink cartridges (which examiner understands to correspond to element 171 in the instant drawings) comprises an ink set including a combination of at least two ink tanks wherein each ink set includes at least one separable ink tank which is separable from the print head. However, upon review of the original specification, Examiner was unable to find adequate disclosure to support such limitations. Examiner notes pages 6-7 and 23-24 of the original specification which describe how the individual ink cartridges 171 may be replaced with ink cartridges of another color to provide a different ink set. However, Examiner was unable to find a disclosure of ink cartridges that include separable ink tanks. For the purpose of examination, Examiner will treat these limitations as ink cartridges that may be individually replaced with ink cartridges of a different color so as to provide a different ink set.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (US 6158834) in view of Otsuki et al. (US 6532026 B2).

Regarding claim 9:

Kato et al. disclose a printing apparatus (recording apparatus 100) comprising a print head (recording head unit 103) that has a plurality of nozzle groups including a plurality of nozzles for ejecting an identical color ink (col. 12, lines 23-25), the printing apparatus having a bi-directional printing function of performing main scanning for moving the print head relative to a printing medium and sub scanning for moving the print head relative to the printing medium in a direction that traverses a direction of the main scanning, and ejecting ink from nozzles onto the printing medium on each of forward passes and backward passes of the main scanning of bi-directional movement to form dots on the printing medium (col. 8, lines 41-53 & Fig. 4), the printing apparatus comprising:

a print head (recording head unit 103) that is fixed to the printing apparatus (Fig. 4) and that comprises an ink cartridge mount (unreferenced cartridge mount shown in Fig. 12) that can mount on or more ink cartridges (ink tanks 20 - col. 12, lines 23-28, 32-36);

wherein the combination of the one or more ink cartridges (20) comprises an ink set, each ink cartridge containing ink to be supplied to each of the nozzle groups (col. 12, lines 23-31);

wherein the ink set includes at least one separable ink cartridge (e.g. bk ink cartridge) which is separable from the print head (col. 12, lines 28-31 & Fig. 12), such that in a first ink set (e.g. S, Bk, bk, C, M, Y, c, m, and y) of the printing apparatus, at least the separable ink cartridge is replaceable with another ink cartridge (Bk ink cartridge) containing a different type of ink, thereby changing the combination of ink tanks therein to form a second ink set (col. 12, lines 49-57 & Fig. 13C).

Kato et al. do not expressly disclose that the printing apparatus comprises a position adjustment value storage that stores a position adjustment value for reducing misalignments of dot forming positions between forward passes and backward passes of the main scanning;

a position adjuster that adjusts dot forming positions along the main scanning direction during the bi-directional printing based on the position adjustment value stored in the position adjustment storage;

the printing apparatus can use a first bi-directional print mode that selectively uses inks included in the first ink set and a second bi-directional print mode that selectively uses inks included in the second ink set so that a combination of inks used in the first bi-directional print mode is different from a combination of inks used in the second bi-directional print mode,

the position adjustment value storage can store a plurality of position adjustment values including a first position adjustment value for the first bi-directional print mode and a second position adjustment value for the second bi-directional print mode, and

the position adjustment unit selects a position adjustment value for a bi-directional print mode used by the printing apparatus out of the plurality of position adjustment values to adjust dot forming positions.

However, Otsuki et al. disclose a printing apparatus comprising:

a position adjustment value storage (PROM 43) that stores a position adjustment value (relative & reference correction values) for reducing misalignments of dot forming positions between forward passes and backward passes of the main scanning (col. 10, lines 55-67);

a position adjuster (positional deviation correction section 210) that adjusts dot forming positions along the main scanning direction during the bi-directional printing based on the position adjustment value stored in the position adjustment storage (col. 11, lines 10-16);

wherein the printing apparatus can use a first bi-directional print mode (e.g. 6 color printing – col. 12, lines 40-43) that selectively uses inks included in a first ink set (K, C, M, Y, LC, LM) and a second bi-directional print mode (e.g. 4 color printing – col. 13, lines 34-37) that selectively uses inks included in a second ink set (K, C, M, Y) so that a combination of inks used in the first bi-directional print mode is different from a combination of inks used in the second bi-directional print mode,

the position adjustment value storage (43) *can store* a plurality of position adjustment values (e.g. relative correction values – col. 10, lines 55-67) including a first position adjustment value for the first bi-directional print mode and a second position adjustment value for the second bi-directional print mode (PROM 43 is capable of storing a plurality of different relative correction values - col. 9, lines 56-60 & col. 13, lines 34-37), and

the position adjuster (210) selects a position adjustment value for a bi-directional print mode used by the printing apparatus out of the plurality of position adjustment values to adjust dot forming positions (col. 11, lines 5-10).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize positional deviation correction values for different color print modes, such as disclosed by Otsuki et al., into the invention of Kato et al. One motivation for utilizing the different correction values, as taught by Otsuki et al., is to alleviate printing positional deviation that arises between forward and reverse passes during bi-directional printing (col. 1, lines 50-53) by using correction values that will most positively affect the image quality (col. 9, lines 61-65 & col. 13, lines 34-46).

Regarding claim 10:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, and **Otsuki et al. also disclose** that the first bi-directional print mode and the second bi-directional print mode are bi-directional color printing modes (col. 9, lines 56-60 & col. 13, lines 34-37).

Regarding claim 11:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, and **Otsuki et al. also disclose** a test pattern generator that generates a test pattern (such as shown in Fig. 13) to be printed (col. 8, lines 31-33),

wherein the test pattern can be used to test misalignments of the dot forming positions (col. 8, lines 31-58 & Fig. 13); and

a position adjustment value setter that allows a user to set the position adjustment value to be stored in the position adjustment value storage (col. 8, lines 24-26),

wherein the test pattern generator can generate a test pattern suitable for the first bi-directional print mode (col. 12, lines 40-43) and a test pattern suitable for the second bi-directional print mode (col. 13, lines 30-37).

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. as modified by Otsuki et al., as applied to claim 9 and 11 above, and further in view of Ohtsuka et al (US 6145950).

Regarding claim 12:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 11, and **Otsuki et al. also disclose** that a user is able to select a bi-directional print mode to be subject to setting of the position adjustment value out of the plurality of available bi-directional print modes (via changing print head units – col. 12, lines 44-67), and that the test pattern generator generates the test pattern suitable for each of the bi-directional print modes (Figs. 12-13).

Kato et al. as modified by Otsuki et al. do not expressly disclose that the ink cartridges comprise a memory that stores information including types of contained inks;

that the printing apparatus comprises a reader for reading out information stored in the memory; and

that the position adjustment setter displays a plurality of bi-directional print modes available to the printing apparatus based on information read out by the reader and allow a user to select a bi-directional print mode to be subject to setting of the position adjustment value out of the plurality of available bi-directional print modes.

However, Ohtsuka et al. disclose ink cartridges that comprise a memory (electrical pads 1-3) that stores information including types of contained inks (ID information);

a printing apparatus that comprises a reader (contact 71) for reading out information stored in the memory (col. 9, lines 1-6); and

displaying a plurality of bi-directional print modes available to the printing apparatus based on information read out by the reader (col. 21, lines 22-26, 44-45) and allow a user to select a bi-directional print mode (col. 21, lines 45-48).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize ink cartridges having memories to determine the available print modes into the invention of Kato et al. as modified by Otsuki et al. The motivation for doing so, as taught by Ohtsuka et al., is to produce a high-quality image by using a print mode in accordance with the type of ink (col. 5, lines 8-11).

Regarding claim 13:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, and **Otsuki et al. also disclose** that the position adjustment value setter (210) sets the position adjustment value based on the print mode (e.g. col. 12, lines 29-43 & col. 13, lines 34-37).

Kato et al. as modified by Otsuki et al. do not expressly disclose that the ink cartridge comprises a memory that stores information used to set the position adjustment value; and

the printing apparatus further comprises:

a reader that reads out the information from the memory; and

setting a print mode based on the information read out from the memory.

However, Ohtsuka et al. disclose an ink cartridge (ink cartridge 1) that comprises a memory (electrical pads 1-3) that stores information (ID information) that may be used to set a position adjustment value (col. 7, lines 62-64); and

the printing apparatus further comprises:

a reader (obvious to Fig. 1) that reads out the information from the memory (col. 9, lines 1-6); and

setting a print mode based on the information read out from the memory (col. 21, lines 22-26).

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al. as modified by Otsuki et al., as applied to claim 9 above, and further in view of Fuse (US 5539434).

Regarding claim 14:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, but **Kano et al. as modified by Otsuki et al. do not expressly disclose** that the position adjuster uses a preset standard value when the position adjustment value storage does not store the position adjustment value for the bi-directional print mode used by the printing apparatus.

However, Fuse discloses using a preset standard value (default values) when the position adjustment value storage does not store the position adjustment value for the print mode used by the printing apparatus (col. 10, line 66 – col. 11, line 16 and Fig. 7).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize preset standard values when the position adjustment value storage does not store the position adjustment value into the invention of Kato as modified by Otsuki et al. The motivation for doing so, as taught by Fuse, is so that all of the nozzles may be used, which will allow printing operations with high efficiency (col. 11, lines 17-22).

Regarding claim 15:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, but **Kato et al. as modified by Otsuki et al. do not expressly disclose** that the position adjuster uses the position adjustment value for another bi-directional print mode when the position adjustment storage does not store the position adjustment value for the bi-directional print mode used by the printing apparatus.

However, Fuse discloses using the position adjustment value (default values) for another bi-directional print mode when the position adjustment storage does not store the position adjustment value for the bi-directional print mode used by the printing apparatus (col. 10, line 66 – col. 11, line 16 and Fig. 7 show that the default values are used for any print mode; thus the default values are used for another print mode).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. as modified by Otsuki et al., as applied to claim 9 above, and further in view of Otokia (US 6827418 B2).

Regarding claim 16:

Kato et al. as modified by Otsuki et al. disclose all the limitations of claim 9, but **Kato et al. as modified by Otsuki et al. do not expressly disclose** that the position adjuster outputs a warning when the position adjustment value storage does not store the position adjustment value for the bi-directional print mode used by the printing apparatus.

However, Otokia discloses a printing apparatus that outputs a warning (message) when a position adjustment is required for the bi-directional print mode used by the printing apparatus (col. 7, lines 56-65).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize a warning into the invention of Kato et al. as modified by Otsuki et al., such as suggested by Otokia, when the position adjustment value storage does not store the position adjustment value. One motivation for utilizing such a warning, is so that the printing apparatus will have proper actuation timing of the print head (col. 7, lines 56-65).

Allowable Subject Matter

Claims 1-8 and 18-25 are allowed.

Claims 1-8 are allowable over the prior art of record because the prior art does not disclose, teach, or suggest a bi-directional printing method comprising the step of selectably mounting a first ink set or a second ink set having mutually different combinations of ink, wherein a combination of inks used in the first bi-directional print mode is different from a combination of inks used in the second bi-directional print mode, and the step of providing a first position adjustment value for the first bi-directional print mode and a second bi-directional value for the second bi-directional print mode,. It is these steps, in combination with other features and limitations of claim 1, that makes these claims allowable over the prior art of record.

Claims 18-25 are allowable over the prior art of record because the prior art does not disclose, teach, or suggest a bi-directional printing method comprising the step of selectably mounting a first ink set or a second ink set associated with a first bi-directional print mode and a second bi-directional print mode, respectively, and the step of storing a first plurality of position adjustment values associated with the first bi-directional print mode and a second plurality of position adjustment values associated with the second bi-directional print mode. It

Art Unit: 2861

is these steps, in combination with other features and limitations of claim 18, that makes these claims allowable over the prior art of record.

Response to Arguments

Applicant's arguments with respect to claims 9-16 have been considered but are moot in view of the new ground(s) of rejection. Please see the above obviousness-type rejection based on the disclosures provided by Kano et al., Otsuki et al., and Inui.

Art Unit: 2861

Communication with the USPO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHELBY FIDLER whose telephone number is (571)272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shelby Fidler/
Patent Examiner
AU 2861

/LUU MATTHEW/
Supervisory Patent Examiner, Art Unit 2861